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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,177	01/31/2002	Ralph G. Beil	TTU D-0300	6532

7590 03/05/2004

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EXAMINER	
LEE, JOHN D	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 03/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/059,177	BEIL ET AL.	
	Examiner	Art Unit	
	John D. Lee	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *11-18 and 27-34* is/are allowed.

6)☒ Claim(s) *1,9,10,19,25 and 26* is/are rejected.

7)☒ Claim(s) *2-8 and 20-24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification (Abstract) is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0502*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The eight (8) sheets of drawing filed with this application are objected to because the lines and numerals therein are, in some instances, faint and indistinct while, in other instances, thick and blurred. A proposed drawing correction or corrected drawings are required in reply to this Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The abstract of the disclosure is objected to because it is too long. The Examiner has counted 199 words, but the present Rules of Practice limit the abstract to a maximum of 150 words. Correction is required. See MPEP § 608.01(b).

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claims 11 and 32 are objected to because of the following minor informalities: claim 11 fails to end with a period, and in line 3 of claim 32, "eight" should be "eighth". Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1 and 19 are rejected under 35 U.S.C. § 102(a) as being anticipated by the cited press release from the University of Toronto, Canada. This document describes a quantum switch (and method of providing a switching function using the quantum switch) which includes: a medium (crystal) containing a first elementary particle (first photon); a control beam transmitting a second elementary particle (second photon) which

is directed so as to interact with the first photon in the crystal, thereby changing a state (transmissibility or non-transmissibility) of at least one of the two photons; and an output for conveying the at least one of the two photons when it has been changed to the transmissible state.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 9, 10, 25, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the cited press release from the University of Toronto, Canada. The reference does not give any details regarding the crystal medium wherein the interaction between the two photons takes place. Because of the nature of the interaction, however, one of ordinary skill in the art would have concluded that a nonlinear optical interaction must be occurring and therefore the crystal must be a nonlinear optical crystal. The person of ordinary skill in the art would further have concluded that any of the well-known and commonly used nonlinear optical crystal materials (including beta barium borate) would have been used in the quantum switch of the reference.

Claims 2-8 and 20-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. There is no indication that the quantum switch described in the cited press release from the University of Toronto, Canada could involve an interaction between photons and electrons.

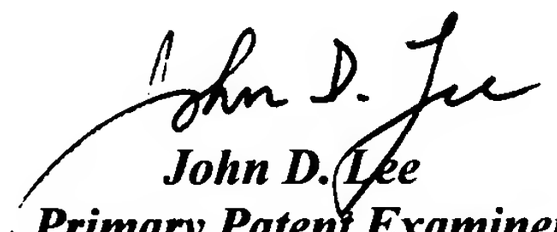
Claims 11-18 and 27-34 are allowable over the prior art of record. The prior art (including the cited press release from the University of Toronto, Canada) does not disclose or reasonably suggest a switching circuit which comprises cascaded first and second quantum switches having the inputs and outputs interconnected as set forth in claim 11 herein. Neither does the prior art disclose or reasonably suggest a method for operating such a cascaded quantum switch-based switching circuit (as set forth in claim 27 herein).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other quantum switches known in the prior art (none of which operate according to the principles of the present claimed invention) can be seen in the cited documents to Kang et al, Ham (2 documents), and Zhang et al, and in the IBM Technical Disclosure Bulletin publication.

All of the prior art documents cited by applicant in the Information Disclosure Statement filed on May 8, 2002, have been considered and made of record. Note the attached initialed copy of form PTO-1449.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562, to the technical support staff supervisor (Team 2) at telephone number (571) 272-1564, or to the Technology Center 2800 Customer Service Office at telephone number (571) 272-1626.



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Group Art Unit 2874